

THE GROWTH OF THE MUSSEL MYTILUS CALIFORNIANUS

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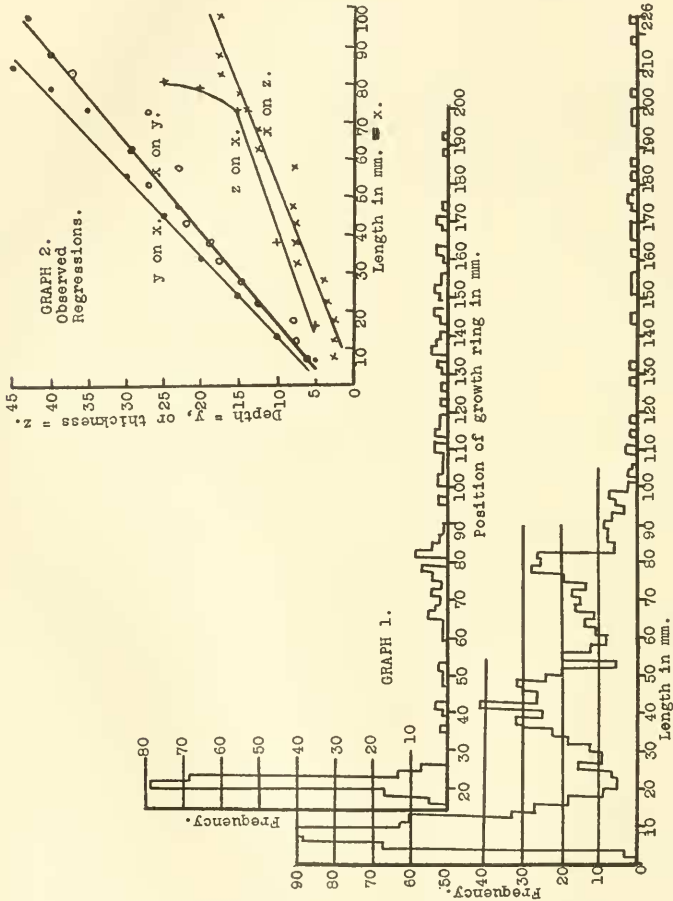
During the first part of July, 1926, over one thousand specimens of *Mytilus californianus* were gathered at random from the point immediately south of the Bird Rocks at the Hopkins Marine Station, Pacific Grove, California. The left valve of each of these animals was saved to be measured as a growth study. The mussels came from three places, each within one and one-half meters of the others and all of the animals at each spot were gathered. These sample spots were about thirty centimeters square. Consequently, these animals are representative of the mussel population on this point and give some indication of the sizes and ages of the animals to be found there. This mussel is not cosmopolitan like *Mytilus edulis* but is confined to the Pacific Coast. It occurs on rocks exposed to the surf and reaches a larger size than *M. edulis*.

The greatest length of the valve, the depth, or dorso-ventral dimension, of the shell at its widest part and the thickness of the valve, greatest perpendicular distance to outside of shell at the same place the depth was measured, were all measured to the nearest millimeter on about two hundred of the animals so chosen to be representative of the whole lot. The length was measured on the rest of the animals. Later eighty larger shells were added, taken from the beach, to show the later growth rings. This made in all 1188 valves measured.

The frequency of animals of each length is shown on graph 1. The distance from the umbo to the growth rings was measured on all of the shells showing rings. The positions and frequencies of the rings are also shown on graph 1. As will be seen the population consists mainly of smaller individuals. This fact is of further interest as this point is accessible only at the lower tides and is not typical

of the point frequently raided by the summer tourist.

The growth rings of this species do not show clearly thru the periostracum. The badly worn beach shells show the growth rings somewhat better tho not distinctly. On the



smaller shells the first ring is easily seen but the two year shells begin to show wear near the umbo and older shells are worn so smooth in this region that all external traces of the earlier rings are gone.

The mode of the first growth ring, as is seen on graph 1, falls between the first two modes for total length. As these animals were collected during the summer the first length mode must be from growth from eggs liberated a year ago this spring. Furthermore, very few animals have the same length as the distance of the first growth ring. This information definitely locates the first growth ring.

It is not as easy to place the length of a two year old mussel and still less so for each succeeding ring. A graph not here reproduced shows the curve which seems to the writer to be the best guess as to the growth curve for this mussel from these data. This curve is not the clear cut growth curve like those found for other molluscs and shows that this species is less satisfactory for growth studies because of the great difficulty in locating the growth rings. It seems doubtful if more measurements will permit constructing the complete growth curve of this animal.

The shell seems to be definitely proportioned, for with a sample of 201 mussels the correlation of length with thickness is 0.94 and for length and depth is 0.98. The regressions are plotted on graph 2 as the observed average depth for each length, etc. These regressions are practically linear except for that of thickness on length which changes sharply for the larger animals. Possibly the rounding of the thickness measurements, whose magnitude is small, to the nearest millimeter may explain this irregularity.

Measurements of length, depth and thickness, and of growth rings of 1188 *Mytilus californianus* are presented with their interrelations and distribution as found in a typical mussel population. The mussel was found not to be satisfactory for a growth study owing to the difficulty of accurately locating the growth rings beyond those of the first year.

The writer desires to express his appreciation for courtesies extended to him by Dr. W. K. Fisher, Director of the Hopkins Marine Station and to acknowledge his indebtedness to Dr. F. W. Weymouth for aid and advice in interpreting this rather difficult material.

PUBLICATIONS RECEIVED

NEW SPECIES OF MOLLUSKS OF THE GENUS CORBICULA FROM URUGUAY AND BRAZIL. By William B. Marshall (Proc. U. S. Nat. Mus., Vol. 72, Art. 3, pp. 1-7, pl. 1, 1927). Six new species of the subgenus *Cyanocyclus* are described and figured.

THE AUSTRALIAN LAND SHELL *THERSITES BIPARTITA* AND ITS ALLIES. By William B. Marshall (Proc. U. S. Nat. Mus., Vol. 72, Art. 15, pp. 1-16, pls. 1-3, 1927). Two new species and 17 new subspecies are described and figured.

NEW MOLLUSCS FROM VANIKORO. By Tom Iredale. (Records Australian Mus., Vol. 14, No. 1, pp. 73-78, pl. 5, 1927.) One new genus *PINGUITELLINA* Type *Tellina robusta* Hanley is described.

HIBERNATION AND AESTIVATION IN GASTROPOD MOLLUSCS. By Sundra Lal Hora and H. Srinivasa Rao. (Records Indian Mus., Vol. 29, pt. 2, pp. 49-61, 1927.) An interesting paper on the habits of some of the little known oriental land shells, with figures of the epiphragms, etc.

MANUAL OF CONCHOLOGY 2 ser. part 109, Pulmonata, pp. 1-48, pls. 1-8, Nov., 1927. Strobilopsidae. By Henry A. Pilsbry. This is the first part of Vol. 28 containing part of the family Strobilopsidae. Three new species, two new subspecies, a new subgenus, *DISCOSTROBILOPS*, type *S. hubbardi* and a new section *EOSTROBILOPS*, type *S. hirasei*, are described. The illustrations are exceedingly fine, with sections of the shells showing the internal lamellae.

C. W. J.

SOME MOLLUSKS AND OTHER INVERTEBRATES FROM THE NORTHWEST. By Elberta L. Craig (Univ. of Colo. Studies, XVI, No. 1, June, 1927). Records from many localities in the Puget Sound region, Alaska, British Columbia and Yukon Territory, of marine, land and fresh water mollusks collected by Prof. Junius Henderson in 1925.